

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 23

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte

YORIHISA YAMAMOTO, YUTAKA NISHI, TAKASHI NISHIMORI, HIROYUKI
TOKUNAGA, and HIDEKI MACHINO

Appeal No. 1999-1056
Application No. 08/525,844

HEARD: February 23, 2000

Before McQUADE, NASE, and GONZALES, Administrative Patent
Judges.

GONZALES, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal from the examiner's final

Appeal No. 1999-1056
Application No. 08/525,844

rejection of claims 1, 6 and 15 through 17. Claims 2 through 5, 7 through 14 and 18, the only other claims in the application, are objected to as being dependent upon a rejected claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The invention is directed to a vehicle steering control system. The subject matter before us on appeal is illustrated by reference to claims 1, 6 and 15 which, along with the other claims on appeal, have been reproduced in an appendix attached to the main brief.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Ito et al. (Ito)	4,830,127	May 16,
1989		
Yamamoto et al. (Yamamoto)	5,528,497	Jun. 18,
1996		

(filed Sep. 16, 1993)

Claims 1, 6 and 15 through 17 stand rejected under 35 U.S.C. § 103 as being unpatentable over Yamamoto in view Ito.

The full text of the examiner's rejection and the

Appeal No. 1999-1056
Application No. 08/525,844

response to the arguments presented by appellants appear in the answer (Paper No. 16, mailed June 19, 1998), while the complete statement of appellants' arguments can be found in the main and reply briefs (Paper Nos. 15 and 18, filed May 4, 1998 and August 24, 1998, respectively).

OPINION

In reaching our decision in this appeal, we have given careful consideration to the appellants' specification and claims, to the applied prior art references, and to the respective positions articulated by the appellants and the examiner. As a consequence of our review, we have made the determinations which follow.

In rejecting claims under 35 U.S.C. § 103 the examiner bears the initial burden of presenting a prima facie case of obviousness. In re Rijckaert, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993); In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). Only if that burden is met does the burden of coming forward with evidence or argument shift to the applicant. Id. If the examiner

Appeal No. 1999-1056
Application No. 08/525,844

fails to establish a prima facie case, the rejection is improper and will be overturned. In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). In order to establish the prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 985, 180 USPQ 580, 583 (CCPA 1974).

We begin our review with independent claims 1 and 6. We note that claim 6 calls for a vehicle steering control system comprising a manual steering torque input means for manually applying a manual steering torque and powered steering actuator means for applying an actuating steering torque to steerable wheels of a vehicle, means for detecting a lateral dynamic condition of the vehicle and control means for controlling the actuating steering torque according to the detected lateral dynamic condition so that actuating steering torque is dependent on the detected lateral dynamic condition and a change rate of the detected lateral dynamic condition in

such a manner that the detected lateral dynamic condition contributes to the actuating steering torque so as to reduce the detected lateral dynamic condition and the change rate of the detected lateral dynamic condition contributes to the actuating steering torque so as to reduce the detected lateral dynamic condition in a high speed range and so as to increase the detected lateral dynamic condition in a low speed range.

Claim 1 is similar to claim 6, except it specifically defines the detected lateral dynamic condition as the yaw rate.

The examiner acknowledges that Yamamoto fails "to teach the increase of thee [sic] yaw rate [or lateral dynamic condition] based on a low speed range or a high speed range" (answer, page 4). The examiner describes Ito (id.) as teaching: (1) "a yaw rate in a middle and low speed region"; (2) the adjustment of the steering reaction force imposed on the steering wheel according to lateral acceleration; (3) an equation for the steering reaction defined as K'' ; (4) "the

change of lateral acceleration in the steering reaction force"; and (5) "high and low vehicle speed ranges." Based on these findings, the examiner determined that it would have been obvious to modify the vehicle steering control system of Yamamoto "by incorporation [sic] the change in yaw rate according to the speed range from the system and method of Ito" in order to obtain various advantages thereof (id.).

Based on our review, we can find no teaching or suggestion in Ito of a control means for controlling the actuating steering torque according to a lateral dynamic condition, whether detected or estimated, so that actuating steering torque is dependent on the lateral dynamic condition and a change rate of the lateral dynamic condition in such a manner that the lateral dynamic condition contributes to the actuating steering torque so as to reduce the detected lateral dynamic condition and the change rate of the lateral dynamic condition contributes to the actuating steering torque so as to reduce the detected lateral dynamic condition in a high speed range and so as to increase the detected lateral dynamic condition in a low speed range. Accordingly, we agree with

appellants that even if the teachings of Ito were combined with those of Yamamoto, the resulting steering control system would not have included all of the limitations of claims 1 and 6. Thus, the examiner has failed to establish the prima facie obviousness of the invention defined by these claims. See, In re Royka, supra.

Ito discloses a system and method "for controlling a steering reaction force for a vehicle which improves the easiness in steering operation of the steering wheel" (col. 2, lines 8-10). Ito describes two embodiments. In both embodiments, the steering torque or reaction force T_c of the steering wheel 1 is detected by a sensor 8 and adjusted by means of a computer-controlled servo motor DM so as to become substantially equal to a calculated target steering torque or reaction force value T_c (col. 5, lines 17-20 and col. 6, lines 33-38). In the first embodiment (Figures 2-4), the target steering torque T_c is calculated using the formula $T_c = K^*$. In the second embodiment, the target steering torque is adjusted according to the estimated value of two motion state

variables of the vehicle, namely, yaw rate N^* and lateral acceleration $"^*$ according to the formula

$$T_c = K \{ C_1(V) \times V \times N^* + C_2(V) \times ""^* \}$$

where $C_1(V)$ and $C_2(V)$ denote coefficients having a relationship to vehicle speed as shown in Figure 7. As can be seen in Figure 7, Ito weighs the determination of the target steering reaction more highly toward yaw rate at low speeds and more highly toward lateral acceleration at high speed, but neither coefficient is shown to be in the negative range at any speed. Thus, as correctly pointed out by appellants (main brief, page 7), Ito's estimated lateral dynamic conditions, i.e., yaw rate and lateral acceleration, never function to reduce an overall lateral dynamic condition in a high speed range and to increase the overall lateral dynamic condition of the vehicle in a low speed range.

In view of the above, we will not sustain the standing 35 U.S.C. § 103 rejection of claims 1 and 6.

Turning next to independent claim 15, we note that the claim calls for a vehicle steering control system comprising a manual steering torque input means for manually applying a

manual steering torque and powered steering actuator means for applying an actuating steering torque to steerable wheels of a vehicle, means for detecting a lateral dynamic condition of the vehicle and control means for controlling the actuating steering torque according to the detected lateral dynamic condition so that the actuating steering torque is dependent on a difference between the detected lateral dynamic condition and a reference lateral dynamic condition computed from a change rate of the detected lateral dynamic condition.

The examiner's position is that Yamamoto's second embodiment discloses the control means of claim 15 (answer, page 7). Yamamoto's second embodiment is shown in Figures 12-14 and discussed at column 7, line 63 et seq. In this embodiment, the target steering reaction TA' is determined by the sum of steering reactions $T1'$, $T2'$ and $T3'$ (col. 8, lines 18-22). Steering reaction $T2' = f2' \times ((-\dot{\theta}_0))$, where $\dot{\theta}_0$ is the detected yaw rate, $\dot{\theta}_0$ is a computed reference yaw rate response model and $f2'$ is a coefficient obtained from a data table, e.g., Figure 15(B), using the vehicle speed as the address (Figure 13 and col. 8, lines 5-8 and 12-18). We agree

with appellants' argument (reply brief, page 4) that Yamamoto fails to teach or suggest a means for controlling the actuating steering torque dependent on a difference between the detected lateral dynamic condition and a reference lateral dynamic condition computed from a change rate of the detected lateral dynamic condition. Rather, Yamamoto teaches a means for controlling the actuating steering torque dependent on a difference between the detected lateral dynamic condition and a reference lateral dynamic condition which is predicted from a steering input to the steering torque input means (col. 3, lines 24-30). Because the additionally cited Ito reference does nothing to remedy this deficiency, we have concluded that the combined teachings of the applied prior art fail to teach or suggest the invention defined in claim 15.

Since all the limitations of claim 15 are not found in the applied prior art or obvious therefrom, it follows that the examiner's rejection of claim 15 under 35 U.S.C. § 103 will not be sustained.

Claims 16 and 17 are dependent on claim 15 and, therefore, contain all of the limitations of that claim.

Appeal No. 1999-1056
Application No. 08/525,844

Therefore, we will also not sustain the standing 35 U.S.C. §
103 rejection of claims 16 and 17.

In summary, the examiner's rejection of claims 1, 6 and
15 through 17 under 35 U.S.C. § 103 is reversed.

REVERSED

JOHN P. McQUADE)	
Administrative Patent Judge)	
)	
)	
)	
)	
)	
JEFFREY V. NASE)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
)	

Appeal No. 1999-1056
Application No. 08/525,844

JOHN F. GONZALES
Administrative Patent Judge

)
)
)
)

rwk

CARRIER, BLACKMAN & ASSOCIATES P.C.
24101 NOVI RDAD
SUITE 100
NOVI MI 48375-3248